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Oolitic Sand: An Introduction

Abstract:

In this lesson students will look at two types of sand (oolitic and regular sand box sand) and describe them with words. They will look at both types of sand under a dissecting microscope and draw what they see (shape, color, etc.). The students will compare and contrast the characteristics of both types of sand.

Grade Level: 4th

Utah Elementary Core Curriculum Standards:

Standard 3040-05

Students will explore and classify a variety of Utah soils

Objectives:

3040-0501
Gather data on the components of soil.

- Estimate the amount of mineral and organic materials there are in a given sample.
- Demonstrate that soil also contains air and water.

3040-0502
Determine soil types such as sand, clay, and silt.

- Analyze a sample of soil for particle size and type, color, odor, and texture.
- Compare compaction and moisture retention of various soils.
- Determine soil types in relation to depth (e.g., topsoil, subsoil, and parent material).
- Categorize several soil samples.

Instruction Time: 30 minutes

Terminology:

Oolitic sand: the unique type of sand found at the Great Salt Lake. It is made of mineralized brine shrimp waste and coated with calcium carbonate layers.

Cysts: the small, round dormant brine shrimp babies.

Intended Learning Outcomes:

- Students will compare and contrast two types of sand.
- Students will identify the characteristics of two types of sand.

Background:

The unique type of sand found in the Great Salt Lake in Utah is unique to hypersaline lakes. The Great Salt Lake is full of tiny creatures called brine shrimp. The brine shrimp waste is mineralized over time and becomes this special oolitic sand. This special sand may be found mixed with the salt from the very salty water and the brine shrimp cysts or eggs. The oolitic sand is very special because it is not found anywhere else. It is truly unique to Utah.

The regular sand box type of sand that can be found anywhere is made up of tiny pieces of rock and dirt. Regular sand grains can be found in many different shapes, but oolitic sand is mainly spherical in shape. Cysts and salt will only be found in oolitic sand, not regular sand. Regular sand box sand also comes in many different colors, but oolitic sand is always gray in color. Oolitic sand is special because of the unique materials it is made up of and where it is found, only in salt lakes like Utah's Great Salt Lake.

Materials:

Oolitic Sand (found on Barten Co. web site)
Sand Box Sand
Dissecting Microscopes
Small Dishes for Sand
Observation Sheet

Prior Knowledge Assessment:

Ask the students to write down everything they know about sand (what it looks like, what is made of, etc.). As a class, discuss what the students know about sand and what they think sand from the Great Salt Lake might be like.

Procedure:

*Talk about the terminology and how it will be used.

1. Have the students observe both types of sand with only their eyes and then describe what they see in a written form on the observation sheet.
2. Now, have the students look at both types of sand under the dissecting microscope and draw what they see on the observation sheet.
3. Have the students compare and contrast both types of sand and record comparisons and contrasts on observation sheet.
4. Discuss, as a class, the differences in both types of sand and have the students share their observations.

Assessment Strategies:

- Observation and recording sheet – full credit if all 3 sections are filled in with the student's observations and recordings.
- The teacher's observations during class work and discussions.

Sand Observation Sheet

Name: _____

After looking at the two types of sand, describe, in words, what you observed (texture, shape, color, etc.)

After looking at the two types of sand under the microscope, draw what you observed.

Compare and contrast they two types of sand.

The sands are different because…

Separating Oolitic Sand Mixture: An Experiment

Abstract:

In the following activity students will predict which method will separate the mixture best and experiment with different materials for separating the oolitic sand mixture. The students will also write down their findings on a recording data sheet.

Grade Level: 4th

Utah State Core Curriculum Standards:

Standard 3040-05

Students will explore and classify a variety of Utah soils

Objectives:

3040-0501

Gather data on the components of soil.

- Estimate the amount of mineral and organic materials there are in a given sample.
- Demonstrate that soil also contains air and water.

3040-0502

Determine soil types such as sand, clay, and silt.

- Analyze a sample of soil for particle size and type, color, odor, and texture.
- Compare compaction and moisture retention of various soils.
- Determine soil types in relation to depth (e.g., topsoil, subsoil, and parent material).
- Categorize several soil samples.

Instructional Time: 35-45 minutes

Terminology:

Oolitic sand: the unique type of sand found at the Great Salt Lake and other hypersaline lakes. It is made of mineralized brine shrimp waste coated with calcium carbonate layers.

Cysts: the small, round dormant brine shrimp babies.

Intended Learning Outcomes:

- Students will observe what happens when different methods are used to experiment with separating the oolitic sand mixture.
- Students will reflect on predictions and findings in a class discussion.

Background:

The unique type of sand found in the Great Salt Lake in Utah is unique to hypersaline lakes. The Great Salt Lake is full of tiny creatures called brine shrimp. The brine shrimp waste is mineralized over time and becomes this special oolitic sand. This special sand may be found mixed with the salt from the very salty water and the brine shrimp cysts or eggs. The oolitic sand is very special because it is not found anywhere else. It is truly unique to Utah.

The regular sand box type of sand that can be found anywhere is made up of tiny fragments of rock. Regular sand grains can be found in many different shapes, but oolitic sand is mainly spherical or ovoid in shape. Cysts and salt will only be found in oolitic sand, not regular sand. Regular sand box sand also comes in many different colors, but oolitic sand is always gray in color. Oolitic sand is special because of the unique materials it is made up of and where it is found, only in salt lakes like Utah's Great Salt Lake.

Materials:

Oolitic Sand Mixture (may be found at Barten Co. web site)
Balloons
Large Magnets
Hot Water
Cold Water
Very Fine Sifter
Something to Stir with
Recording Data Sheet

Prior knowledge Assessment:

Have the class brainstorm some ways they have used sand in the past. Write down the list on the board for everyone to see.

Procedure:

*Set up four different centers around the room. Center1 with the balloons, center 2 with the magnets, center 3 with the hot and cold water, and center 4 with the sifter.

1. Have each student predict which method or instrument they think is best for separating the oolitic sand mixture.
2. Have the students try all the different items (listed above) for separating the mixture.
3. Have the students record their findings on the recording data sheet.
4. As a class, discuss what the students' findings and whether or not they found their predictions to be true.

Assessment Strategies:

- The students' recording data sheet – full credit if all questions are answered and findings are recorded.
- The teacher's observations during the experiment.